

## **PROGRESS REPORT: 04/01/2007-06/30/2007**

### **Forecasts that Communicate: Assessment, Development, and Delivery of Probabilistic Forecasts that Foster Easy, Accurate, and Reliable Interpretation**

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### **Project Description**

The primary objective of this project is to improve the ease, accuracy, and reliability with which seasonal forecast products are interpreted. Supporting objectives are to:

- Foster ongoing, iterative relationships between research, operational forecasting, and water management communities.
- Enable the efficient provision of customizable forecast formats by operational forecasters or information intermediaries (e.g., extension agents).
- Provide feedback tools to the operational forecasting and social science community to track forecast formats and elements preferred by diverse stakeholders.
- Improve water managers' perceptions of climate forecast credibility, through more accurate understanding of the contents of forecast products.

Our project focuses on two components. The first is to quantitatively assess multiple forecast formats for easy, reliable, and correct interpretation. From this effort we hope to identify specific product elements that consistently improve (or confound) forecast communication, which can then be applied to (or eliminated from) a broad range of forecast products. The second component of our proposed work is the implementation of dynamically interactive Internet-based webtools that will allow users to customize a forecast product to best fit their cognitive style, technical capabilities, and decision making needs.

### **Project Activities**

During this reporting period, we used the findings from the prior period to influence the development of new seasonal forecast products.

We continued to work with the Climate Services Division (CSD) of the Office of Weather, Water, and Climate Services, National Weather Service (NWS) in training NWS Weather Forecast Office (WFO) personnel about forecast interpretation and communication, as part of the CSD Climate Operations Training Course. Material in that course was based in part on findings from the surveys and interviews in this project. At

least one person from each of the 122 WFOs has now received training in effectively interpreting the seasonal climate outlooks.

The NWS Climate Prediction Center (CPC) also became interested in the findings from this research project as well. CPC recognized that, in particular, their “Probability of Exceedance (POE) Maps” (URL: <http://www.cpc.ncep.noaa.gov/products/predictions/90day/lead01/poe.html>). CPC was unable to change the format of map due to an onerous product modification process. Instead, we worked with CPC personnel to adapt the figures caption. Figure 1 shows the current text that was adopted by the CPC. Changes included use of the term ‘mid-value’ instead of ‘normal’, a direct interpretation of the chances of conditions for the season falling both above and below the ‘mid-value’, and a recognition that this product is limited because it does not show the range of possibility of conditions over the upcoming season.

**Anomaly (deg F) of the Mid-value of the 3-Month Temperature Outlook Distribution for JFM 2008**

Dashed lines are the median 3-month temperature (degrees F) based on observations from 1971–2000. Shaded areas indicate whether the anomaly of the mid-value is positive (red) or negative (blue) compared to the 1971–2000 average. Non-shaded regions indicate that the absolute value of the anomaly of the mid-value is less than 0.1. For a given location, the mid-value of the outlook may be found by adding the anomaly value to the 1971–2000 average. There is an equal 50–50 chance that actual conditions will be above or below the mid-value. Please note that this product is a limited representation of the official forecast, showing the anomaly of the mid-value, but not the width of the range of possibilities. For more comprehensive forecast information, please see our additional forecast products.

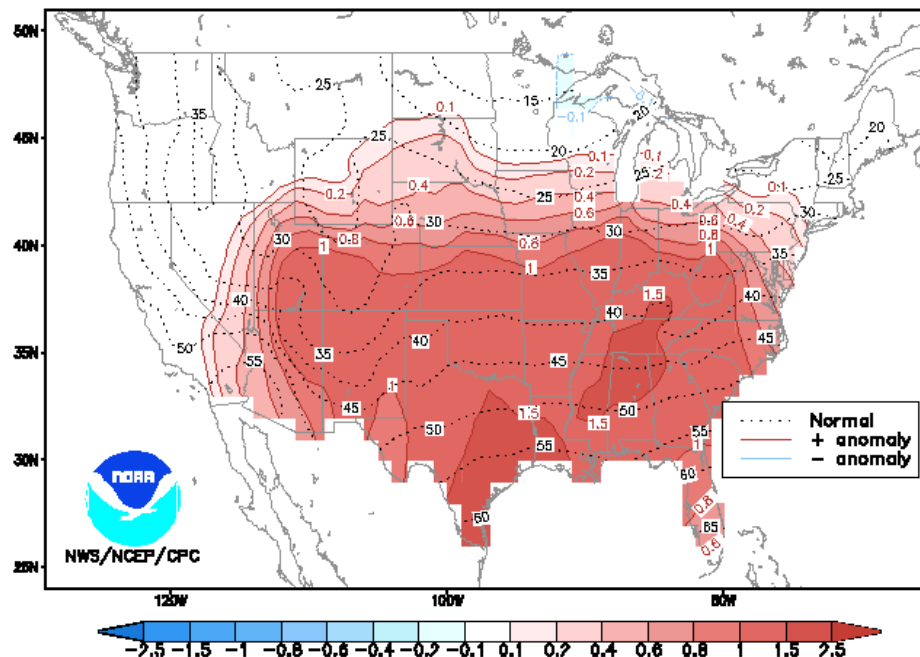


Figure 1. NWS product caption adapted based on project findings.

Based on efforts under this project, we had earlier submitted a proposal to the NWS Climate Test Bed project to work with the CPC, and it was approved to begin July 1, 2007. In part, that project will entrain the survey- and interview-based field testing of communication effectiveness as a formal part of the product development process.

Work continued on our University of Arizona Climate Information Delivery and

Decision Support System (CLIDDSS). Because dynamic NWS products have been precluded by NOAA policy, we focused on proof-of-concept demonstration of the application of CLIDDSS in development of a high-quality newsletter. The Climate Assessment for the Southwest (CLIMAS) project volunteered to participate in the experiment. They used CLIDDSS in the development of their Spring 2007 Border Climate Summary newsletter and demonstrated that CLIDDSS is effective for efficiently incorporating external products in newsletter format, with both 'boiler-plate' standardized text (e.g., from a product provider) and value-added interpretation.

#### Key Results:

- Continued close relationship with CSD in training Climate Focal Points from WFOs in proper interpretation of seasonal climate outlook products.
- Adoption of improved text for the CPC seasonal climate outlook POE mid-value anomaly map.
- Received funding from the NWS Climate Test Bed program, for a \$433,000 project over 3 years, to work with the CPC. In part, that project will entrain the survey- and interview-based field testing of communication effectiveness as a formal part of the product development process.
- Successful demonstration of the use of CLIDDSS to develop a high-quality newsletter using products accessed from other external providers.

#### *Reporting and Technology Transfer*

During this period, we reported on project results in the following presentations (\*=invited presentations, #=international):

\*#Hartmann, H.C., 2007. Climate services and decision support: strategies, tactics, and tools. Informal Seminar, National Land and Water Information System, Agriculture Canada, Regina, SK, 8 June.

\*#Hartmann, H.C., 2007. The use of climate information for decision making. Workshop on Application of Statistics in Agriculture, Agriculture Canada, Regina, SK, 6-7 June.

\*#Hartmann, H.C., 2007. Tools for climate services. Joint Assembly, American Geophysical Union, Acapulco, Mexico, 22-25 May.

\*Hartmann, H.C., 2007. Understanding CPC seasonal outlooks. Operational Climate Services Residential Training Courses, National Weather Service, Kansas City, MO, 10-12 April.

\*Hartmann, H.C., 2007. Climate services and decision support: strategies, tactics and tools. Informal Seminar, Climate Program Office, NOAA, Silver Springs, MD, 15 March.